AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of fabricating a SiGe thin layer semiconductor structure, the method comprising:

providing a substrate having a dielectric layer thereon to a process chamber of a processing system;

depositing a variable composition Si_xGe_{1-x} layer over the dielectric layer so as to have a variable Si:Ge ratio ~~composition~~ over at least a portion of the thickness thereof; and

forming a Si cap layer on the variable composition Si_xGe_{1-x} layer.

2. (Previously Presented) The method according to claim 1, wherein the substrate comprises one of a semiconductor substrate, a LCD substrate, or a glass substrate.

3. (Previously Presented) The method according to claim 1, wherein the dielectric layer comprises at least one of an oxide layer, a nitride layer, an oxynitride layer, or a high-k layer.

4. (Withdrawn) The method according to claim 1, wherein the depositing comprises depositing a plurality of Si_xGe_{1-x} sublayers each with different Ge content.

5. (Previously Presented) The method according to claim 54, wherein the graded Ge content in the graded Si_xGe_{1-x} layer is less than about 0.5.

6. (Withdrawn) The method according to claim 4, wherein the different Ge contents in the Si_xGe_{1-x} sublayers are less than about 0.5.

7. (Withdrawn) The method according to claim 4, wherein the different Ge contents in the Si_xGe_{1-x} sublayers are less than about 0.3.

8. (Previously Presented) The method according to claim 1, wherein depositing the variable composition Si_xGe_{1-x} layer includes providing a graded Ge content, with the Ge content being in the range of about 0.2 to about 0.5 adjacent the dielectric layer and decreasing to a value of 0.1 or less adjacent the Si cap layer.

9. (Withdrawn) The method according to claim 1, wherein depositing the variable composition Si_xGe_{1-x} layer comprises depositing a first Si_xGe_{1-x} sublayer on the dielectric layer, the first Si_xGe_{1-x} sublayer having a Ge content between about 0.5 and about 0.3, and depositing a second Si_xGe_{1-x} sublayer on the first Si_xGe_{1-x} sublayer, the second Si_xGe_{1-x} sublayer having a Ge content between about 0.15 and about 0.05.

10. (Withdrawn) The method according to claim 1, wherein depositing the variable composition Si_xGe_{1-x} layer comprises depositing a first Si_xGe_{1-x} sublayer on the dielectric layer, the first Si_xGe_{1-x} sublayer having a Ge content of about 0.2, and depositing a second Si_xGe_{1-x} sublayer on the first Si_xGe_{1-x} sublayer, the second Si_xGe_{1-x} sublayer having a Ge content of about 0.1.

11. (Previously Presented) The method according to claim 1, wherein the providing comprises introducing a substrate into a process chamber of a single wafer processing system.

12. (Previously Presented) The method according to claim 1, wherein depositing the variable composition Si_xGe_{1-x} layer comprises exposing the substrate to a Si-containing gas and a Ge-containing gas in a chemical vapor deposition process.

13. (Previously Presented) The method according to claim 12, wherein the Si-containing gas comprises at least one of SiH_4, Si_2H_6, SiH_2Cl_2, or Si_2Cl_6, and the Ge-containing gas comprises at least one of GeH_4 or $GeCl_4$.

14. (Previously Presented) The method according to claim 1, wherein the forming a Si cap layer comprises exposing the substrate to at least one of SiH_4, Si_2H_6, SiH_2Cl_2, or Si_2Cl_6 in a chemical vapor deposition process.

15. (Withdrawn) The method according to claim 1, further comprising:

forming a Si-containing seed layer on the dielectric layer, wherein the variable composition Si_xGe_{1-x} layer is deposited on the Si-containing seed layer.

16. (Withdrawn) The method according to claim 15, wherein the Si-containing seed layer comprises one of amorphous Si or poly-Si.

17. (Withdrawn) The method according to claim 15, wherein the Si-containing seed layer comprises a Si_xGe_{1-x} layer.

18. (Withdrawn) The method according to claim 15, wherein the Si-containing seed layer comprises a Si_xGe_{1-x} layer with Ge content of about 0.1, or less.

19. (Withdrawn) The method according to claim 15, wherein the forming a Si-containing seed layer comprises exposing the substrate to a Si-containing gas containing at least one of SiH_4, Si_2H_6, SiH_2Cl_2, or Si_2Cl_6 in a chemical vapor deposition process.

20. (Withdrawn) The method according to claim 19, wherein the exposing further comprises exposing the substrate to an inert gas.

21. (Withdrawn) The method according to claim 19, wherein the exposing further comprises exposing the substrate to H_2.

22. (Withdrawn) The method according to claim 15, wherein the forming a Si-containing seed layer comprises performing an atomic layer deposition process.

23. (Withdrawn) The method according to claim 22, wherein the forming a Si-containing seed layer comprises alternately exposing the substrate to a Si-containing gas and H_2.

24. (Withdrawn) The method according to claim 22, wherein the forming a Si-containing seed layer comprises alternately exposing the substrate to a Si-containing gas, H_2, and a Ge-containing gas.

25. (Previously Presented) The method according to claim 1, wherein the depositing a variable composition Si_xGe_{1-x} layer further comprises heating the substrate to between about 500°C and about 900°C.

26. (Original) The method according to claim 1, further comprising providing a process chamber pressure less than about 100Torr.

27. (Original) The method according to claim 1, further comprising providing a process chamber pressure less than about 1Torr.

28. (Withdrawn) A computer readable medium containing program instructions for execution on a processor, which when executed by the processor, cause a processing apparatus to perform the steps in the method recited in claim 1.

29. (Withdrawn) A computer readable medium containing program instructions for execution on a processor, which when executed by the processor, cause a processing apparatus to perform the steps in the method recited in claim 15.

30-53. (Canceled)

54. (Previously Presented) The method according to claim 1, wherein the depositing comprises depositing a graded Si_xGe_{1-x} layer with a graded Ge content over the thickness thereof.

55. (Previously Presented) The method according to claim 1, wherein the providing comprises introducing a substrate into a process chamber of a batch-type processing system.

56. (Previously Presented) The method according to claim 12, wherein the depositing comprises varying the flow rate of at least one of the Si-containing gas or the Ge-containing gas to vary the Si:Ge ratio ~~composition~~ of the variable composition Si_xGe_{1-x} layer as it is being deposited.

57. (Previously Presented) The method according to claim 56, wherein the flow rate is varied continuously to form a continuously graded Si_xGe_{1-x} layer.

58. (New) A method of fabricating a SiGe thin layer semiconductor structure, the method comprising:

providing a substrate having a dielectric layer thereon to a process chamber of a processing system;

depositing a continuous Si_xGe_{1-x} layer over the dielectric layer so as to have a graded Ge content over at least a portion of the thickness thereof; and

forming a Si cap layer on the continuous Si_xGe_{1-x} layer.

59. (New) The method according to claim 58, wherein the graded Ge content in the continuous Si_xGe_{1-x} layer is less than about 0.5.

60. (New) The method according to claim 58, wherein depositing the continuous Si_xGe_{1-x} layer includes providing a Ge content in the range of about 0.2 to about 0.5 adjacent the dielectric layer and decreasing to a value of 0.1 or less adjacent the Si cap layer.

61. (New) The method according to claim 58, wherein depositing the continuous Si_xGe_{1-x} layer comprises exposing the substrate to a Si-containing gas and a Ge-containing gas in a chemical vapor deposition process.

62. (New) The method according to claim 61, wherein the Si-containing gas comprises at least one of SiH_4, Si_2H_6, SiH_2Cl_2, or Si_2Cl_6, and the Ge-containing gas comprises at least one of GeH_4 or $GeCl_4$.

63. (New) The method according to claim 61, wherein the depositing comprises varying the flow rate of at least one of the Si-containing gas or the Ge-containing gas to vary the composition of the continuous Si_xGe_{1-x} layer as it is being deposited.

64. (New) The method according to claim 63, wherein the flow rate is varied continuously to

form a continuously graded Si_xGe_{1-x} layer.

65. (New) A method of fabricating a SiGe thin layer semiconductor structure, the method comprising:

providing a substrate having a dielectric layer thereon to a process chamber of a processing system;

depositing a layer consisting of Si and Ge and having the formula Si_xGe_{1-x} over the dielectric layer so as to have a variable composition over at least a portion of the thickness thereof; and

forming a Si cap layer on the variable composition Si_xGe_{1-x} layer.

66. (New) The method according to claim 65, wherein the graded Ge content in the continuous Si_xGe_{1-x} layer is less than about 0.5.

67. (New) The method according to claim 65, wherein depositing the continuous Si_xGe_{1-x} layer includes providing a Ge content in the range of about 0.2 to about 0.5 adjacent the dielectric layer and decreasing to a value of 0.1 or less adjacent the Si cap layer.

68. (New) The method according to claim 65, wherein depositing the continuous Si_xGe_{1-x} layer comprises exposing the substrate to a Si-containing gas and a Ge-containing gas in a chemical vapor deposition process.

69. (New) The method according to claim 68, wherein the Si-containing gas comprises at least one of SiH_4, Si_2H_6, SiH_2Cl_2, or Si_2Cl_6, and the Ge-containing gas comprises at least one of GeH_4 or $GeCl_4$.

70. (New) The method according to claim 68, wherein the depositing comprises varying the flow rate of at least one of the Si-containing gas or the Ge-containing gas to vary the composition of the continuous Si_xGe_{1-x} layer as it is being deposited.

71. (New) The method according to claim 70, wherein the flow rate is varied continuously to form a continuously graded Si_xGe_{1-x} layer.